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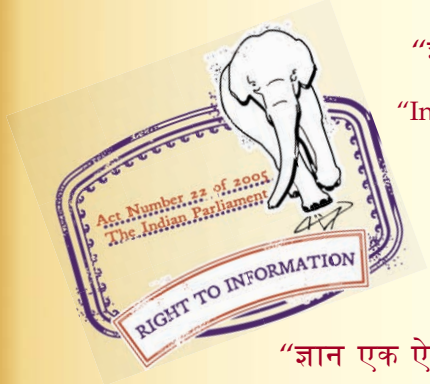
IS 3149 (1994): Enamelware for home use [CHD 9: Ceramicware]



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"Knowledge is such a treasure which cannot be stolen"

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IS 3149 : 1994

(Reaffirmed 2010)

भारतीय मानक

घरेलू व्यवहार के लिए इनेमिल बर्तन – विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

ENAMELWARE FOR HOME USE — SPECIFICATION

(Second Revision)

UDC 643.35.021 : 672.43

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1994 Price Group 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ceramicware Sectional Committee had been approved by the Chemical Division Council.

This standard was first printed in 1965 based on JIS S 3012-1958. It was reviewed and aligned with IS 3972 : 1968 Method of test for vitreous enamelware in 1968. This revision was necessitated due to the revision of IS 3972 and new developments that took place in industry. In this revision a modified method of test for impact resistance has been incorporated.

This standard covers enamelware for domestic use, such as wash bowls, mugs, kettles and pans. In this standard all the requirements pertaining to dimensions and capacity have been left to the agreement between the purchaser and the supplier though tolerances on the declared nominal values have been specified.

The composition of the committees responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value shall be the same as that of the specification.

AMENDMENT NO. 1 JUNE 2005
TO
IS 3149 : 1994 ENAMELWARE FOR HOME USE — SPECIFICATION
(*Second Revision*)

(*Page* 2, *clause* **5.1**) — Insert the following at the end of the clause:

'5.1.1 *BIS Certification Mark*

The product may also be marked with the Standard Mark.

'5.1.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. Te details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(CHD 9)

Reprography Unit, BIS, New Delhi, India

Indian Standard

ENAMELWARE FOR HOME USE — SPECIFICATION

(Second Revision)

1 SCOPE

This Indian Standard prescribes requirements, methods of sampling and test for enamelware for use in homes.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
2717: 1979	Glossary of terms relating to vitreous enamelware and ceramic-metal systems *(first revision*)
3972 (Part 2/ Sec 1) : 1985	Methods of test for vitreous enamelware: Part 2 Test methods, Section 1 Resistance to citric acid at room temperature and boiling temperature *(first revision)*
3972 (Part 2/ Sec 4) : 1988	Methods of test for vitreous enamelware: Part *2* Test methods, Section 4 Resistance to thermal shock (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2717 : 1979 shall apply.

4 REQUIREMENTS

4.1 Dimensions of Wares and Capacity

Dimensions and capacities of the wares shall be as agreed to between the purchaser and the supplier. However, these shall not vary by more than ± 2.5 percent of the declared nominal values.

4.2 Material

The steel sheet shall be of thickness as agreed to between the purchaser and the supplier and the same shall not vary by more than 8 percent on the upper side and 16 percent on the lower side of the nominal value when determined in accordance with the method prescribed in **4.2.1** and **4.2.1.1.**

4.2.1 Remove the enamel layer of the sample of enamelware or a piece cut from it by immersing it, at least up to a depth of 1 cm, in molten caustic soda (sodium hydroxide) at 530 to 550°C in a stainless steel or nickel dish, for a period of 15 to 30 minutes, depending on the thickness of the enamel layer. After the enamel layer has been dissolved from a minimum area of 0.5 cm width and 3 cm length along the edge, wash the sample with water sufficiently to remove the last adhering oxide layer below the enamel. Wipe the exposed metal with clean cloth and quickly dry in an air-oven, maintained at 105 ± 2°C to avoid rusting.

4.2.1.1 Measure the thickness of the exposed metal by means of a micrometer at three points, each point at a distance of at least 1 cm from the preceding one. The average of the three measurements shall be taken as the thickness of the metal.

NOTES

1 For the purpose of this test, it is presumed that the thickness of the metal of the whole ware is the same.

2 In case an enamelware comprises two or more components of different thicknesses welded together, each such component shall be treated as a separate enamelware.

4.3 Workmanship and Finish

The surface of the ware made to the requirements as agreed to between the supplier and the purchaser. Shape shall not have any faults like pin-holes, cracks or crevices which are harmful for its use as a container. The ware shall be reasonably free from warpage.

4.4 Colour and Surface

The surface of the ware shall have a colour and finish — glossy, semi-glossy or matt — as agreed to between the purchaser and the supplier; and the colour, texture and thickness of enamel coating shall be evenly matched.

4.5 Impact Resistance

A steel ball weighing 43 ± 1 g is allowed to fall freely from a height of 80 cm at a plain part of

the ware, having a flat area more than the cross-sectional area of the ball, so that an impact force of 3.4 kg-cm (approx) is derived. The enamel coating shall not show any instantaneous chipping in the impact point. For the purpose of this test, chipping shall be considered as those fracture of enamel coating which result in spontaneous removal/breaking away of the damaged enamel flake. Any delayed chipping or chipping on the opposite side of the impact face, shall not be considered for deciding failure of this test.

NOTE — This value of impect resistance is applicable for the enamel coating having base material thickness from 0.30 to 0.63 mm.

4.6 Acid Resistance

The white and coloured enamelware shall conform to classes AA and A, and classes AA, A and B, respectively, when tested in accordance with IS 3972 (Part 2/Sec 1) : 1985.

4.7 Quench Test

This test shall be conducted on cooking wares only. The enamel coating of such wares when tested at 200°C in accordance with the method prescribed in IS 3972 (Part 2/Sec 4) : 1988 shall not show any signs of cracking, flaking off, crazing or any other damage.

4.8 Leak Test

This test is applicable to kettles only. Dip the ware for more than 10 minutes in a bucket of water coloured with eosin. Any part of the kettle shall not show any leakage, or presence of any red stain.

5 MARKING AND PACKING

5.1 Marking

The enamelware shall be clearly and legibly marked at the bottom by pasting a label, with the following information:

a) Indication of the source of manufacture;
b) Nominal dimensions (and capacity, if required);
c) Batch or lot number in code or otherwise; and
d) Month and year of manufacture.

5.2 Packing

The wares shall be packed as agreed to between the purchaser and the supplier.

6 SAMPLING

6.1 The method of drawing representative samples of the enamelware and determining their criteria of conformity shall be in accordance with Annex A.

ANNEX A

(*Clause* 6.1)

SAMPLING OF ENAMELWARE

A-1 SCALE OF SAMPLING

A-1.1 Lot

In any consignment, all the enamelware of the same shape size, produced from steel sheet of same thickness under similar conditions of manufacture shall be grouped together to constitute a lot.

A-1.2 Each lot shall be considered separately for ascertaining conformity of the lot to the requirements of this specification. The number of enamelware to be selected for this purpose from the lot shall be in accordance with Table 1. The second sample shall be drawn only if required [*see* **A-3.1** (c)].

A-1.2.1 The enamelware shall be selected at random from the lot. To ensure randomness of selection use shall be made of random number tables. In case random number tables are not available, the following procedure may be adopted:

'Starting from any enamelware in the lot count them in one order as 1, 2, 3, ... up to *r* and so on, where *r* is the integral part of *N/n* (*N* being the total number of wares in the lot and *n* the number of wares to be selected). Every rth ware thus counted shall be withdrawn as sample.

A-2 CRITERIA FOR CONFORMITY

A-2.1 Requirements of 4.1 to 4.4

The wares in the first sample shall be inspected for the requirements of dimensions (**4.1**), material (**4.2**), workmanship and finish (**4.3**), and colour and surface (**4.4**). Any ware which fails in any one or more of the requirements

Table 1 Sample Size and Criteria for Conformity

(*Clauses* A-1.2 *and* A-2.2)

61 No.	**Lot Size**	For Characteristics 4.1, 4.2, 4.3 **and** 4.4					No. of Wares to be Tested for Each Test
		Sample	Sample Size	Cumulative Sample Size	Acceptance Number	Rejection Number	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Up to 100	First	8	8	0	2	2
		Second	8	16	1	2	
H)	101 to 300	First	13	13	0	3	3
		Second	13	26	3	4	
iii)	301 to 1 000	First	20	20	1	4	4
		Second	20	40	4	5	
iv)	1 001 and over	First	32	32	2	5	5
		Second	32	64	6	7	

shall be regarded as a defective. The number of defectives in the first sample shall lead to one of the following three steps:

a) If the number of defectives in the first sample is less than or equal to the corresponding acceptance number the lot shall be considered as satisfying these requirements and shall be tested further in accordance with **A-2.2**.

b) If the number of defectives in the first sample is greater than or equal to the corresponding rejection number the lot shall be rejected without further testing.

c) If the number of defectives in the first sample is between the corresponding acceptance number and rejection number, the second sample shall be taken from the lot. The second sample shall also be inspected for these requirements. If the sum of defectives of the first and the second samples is less than or equal to the corresponding acceptance number the lot shall be accepted as satisfying these requirements and shall be tested further in accordance with **A-2.2.** If the sum of defectives is grater than or equal to the corresponding rejection number the lot shall be rejected without further testing.

A-2.2 Requirements of 4.5 to 4.8

The lot which has been declared satisfactory in **A-2.1** shall be subjected to the impact resistance (**4.5**), acid resistance (**4.6**), quench test (**4.7**) and leak test (**4.8**). The number of samples to be subjected to each test shall be in accordance with col 7 of Table 1. They shall be chosen at random from those already inspected and found satisfactory in **A-2.1.**

A-2.2.1 The lot shall be declared as satisfying the requirements is all the wares tested pass the tests.

A-2.3 After the lot has been declared satisfactory in **A-2.1** and **A-2.2,** it shall be tested for impact resistance (**3.5**). For this purpose, five wares shall be taken afresh from the lot at random. The lot shall be considered as satisfying this requirement if all the five wares pass the test.

A-2.4 The lot shall be declared as conforming to the requirements of this specification if it has been declared satisfactory in **A-2.1, A-2.2** and **A-2.3.**

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Ceramicware Sectional Committee, CHD 009

Chairman	*Representing*
SHRI M. K. BASU	Central Glass and Ceramic Research Institute, Calcutta
Members	
DR. K. N. MAITI (*Alternate* to Shri M. K. Basu)	Central Glass and Ceramic Research Institute, Calcutta
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SHRI S. K. GHOSH	All India Pottery Manufacturers Association, Calcutta
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Secretary
SMT M. PASSI
Assistant Director (Chem), BIS

Ceramic Coated Metalware Subcommittee, CHD 009 : 04

Convener	
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Amendments are issued to standards as the need arises on the basis of comments. Standards arc also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

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